

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:

Luo et al.

Serial No.: 10/826,985

Filed: April 19, 2004

For: METHODS FOR FORMING
PROTECTIVE LAYERS ON
SEMICONDUCTOR DEVICE
COMPONENTS SO AS TO REDUCE OR
ELIMINATE THE OCCURENCE OF
DELAMINATION THEREOF AND
CRACKING THEREIN

Confirmation No.: 3493

Examiner: J. Stark

Group Art Unit: 2823

Attorney Docket No.: 2269-5565.1US

VIA ELECTRONIC FILING
May 19, 2009

REPLY BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attn: Board of Patent Appeals and Interferences

Sirs:

This REPLY BRIEF follows the Examiner's Answer of October 17, 2008, and is being
filed in accordance with the requirements of 37 C.F.R. § 41.41.

(7) ARGUMENT

It is respectfully submitted that there are a number of reasons that the teachings of Tong, taken alone (claims 1-8, 19-23, and 25-29) or in combination with teachings from Glenn (claims 9-18) do not support a *prima facie* case of obviousness against the subject matter recited by independent claim 1 of the '985 Application, or against the subject matter recited by any of its dependent claims 2-23 or 25-29.

First, Tong does not teach or suggest a process in which a protective material is subjected to conditions "in which cracks and delaminated areas... are healed..." Independent claim 1. Because of this deficiency, the Examiner has argued that the teachings of Tong relate to use of the same type of material as that disclosed by the above-referenced application. Examiner's Answer, pages 4 and 13. Tong does not provide any teaching or suggestion that the B-stageable material disclosed therein will heal. Nor does Tong teach or suggest any conditions in which cracks in and delaminated areas of the disclosed B-stageable material will heal. Instead, the teachings of Tong relate to a B-stageable material that may be "cleanly cut." Tong, Paragraph [0033]. If the B-stageable material of Tong may, in fact, be cleanly cut, there would be no need for healing and, thus, no reason to heal cracks and/or delaminated areas.

In apparent recognition of the fact that Tong lacks any teaching or suggestion of a B-stageable material that will heal, and of a process in which cracks in and/or delaminated areas of the B-stageable material are healed, the Examiner has attempted to argue that healing would inherently occur in the B-stageable material of Tong. The Examiner notes that the "finite amount of time between the first curing" disclosed by Tong "and the second curing" disclosed by Tong "can be an ambient 'condition' in which healing is *capable of occurring*." Examiner's

Answer, page 14. By using the phrases “can be” and “healing is capable of occurring,” it is apparent that the Examiner is well aware that *healing may not occur* when the process disclosed by Tong is effected and, therefore, that a partially cured B-stageable material will not *inherently* heal when used in the processes that are disclosed by Tong. M.P.E.P. § 2112.

Since the Examiner cannot argue that the B-stageable material of Tong will inherently heal when used in the process disclosed by Tong, he could only argue that the finite period of time between the initial cure and the subsequent is inherent. Nonetheless, that period of time is not necessarily, or inherently, long enough to ensure that any cracks or delaminated areas will necessarily heal.

Thus, regardless of any similarities between the B-stageable material of Tong and the materials that are disclosed by the ‘985 Application, the B-stageable material of Tong will not necessarily, or inherently, heal when the process taught by Tong is effected and Tong, therefore, does not teach or suggest “subjecting at least the protective material to conditions in which cracks and delaminated areas in the protective material that were formed during the at least partially severing are healed,” as required by independent claim 1.

Second, Tong characterizes the disclosed B-stageable material as an “underfill composition,” denoting that the B-stageable material is not finally cured until after it has been assembled between two electronic device components. *See, e.g.*, Tong, paragraphs [0025] and [0026]. Thus, Tong does not teach or suggest that a protective material be “fully cur[ed]... before assembling a semiconductor device components [sic]... to another component of an electronic device,” as required by independent claim 1.

Third, there would have been no reason for one of ordinary skill in the art to have subjected the B-stageable material of Tong to “conditions in which cracks and delaminated areas [therein] that were formed during the at least partially severing are healed,” as Tong clearly teaches a process in which the disclosed B-stageable is initially cured in such a way as to “ensure the clean dicing of [a] wafer into individual chips.” Tong, paragraph [0013]. Specifically, the B-stageable material that is used in the process disclosed by Tong is formulated to have a glass transition temperature that allows it to be “cleanly cut” without cracks or breakage. *Id.* As it is apparent from the disclosure of Tong that cracks and delaminated areas are not a problem after dicing, there could be no apparent reason for one of ordinary skill in the art to subject the B-stageable material of Tong to healing conditions.

Further, by teaching a process in which a partially cured B-stageable material may be cleanly diced (*i.e.*, diced without cracks or delaminated areas), Tong teaches away from the methods of independent claim 1 and its dependent claims 2-23 and 25-29; *i.e.*, Tong teaches away from a method in which a protective material is subjected to healing conditions. M.P.E.P. § 2141.02(VI) (which requires the Examiner to consider parts of Tong that teach away from the claimed subject matter).

Therefore, there wouldn't have been any apparent reason for one of ordinary skill in the art to even attempt to heal cracks or delamination in the manner recited by independent claim 1.

In view of the foregoing, as well as for the reasons presented in the APPEAL BRIEF that has been filed in the '985 Application, it is respectfully submitted that the Examiner has not established a *prima facie* case of obviousness against independent claim 1 or against any of its dependent claims 2-23 or 25-29.

(11) CONCLUSION

It is respectfully submitted that:

(A) Claims 1-8, 19-23, and 25-29 are drawn to subject matter that, under 35 U.S.C. 103(a), is allowable over the subject matter taught by Tong; and

(B) Claims 9-18 are each directed to subject matter that, under 35 U.S.C. § 103(a), is allowable over the teachings of Tong, in view of teachings from Glenn.

Accordingly, reversal of the 35 U.S.C. § 103(a) rejections of each of claims 1-23 and 25-29 is respectfully solicited, as is the allowance of these claims.

Respectfully submitted,



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Date: May 19, 2009

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